

## **Water Resources Research Act Program Subactivity**

Program	1999 Estimate	Uncontrol & Related Chgs	Program Redirect	Program	FY 2000 Budget Request	Change from 1999
Water Resources Research Act Program	5,055	7	0	0	5,062	7
Total Requirements \$000	5,055	7	0	0	5,062	7
Note: The Program Redirect column reflects the redirection of funds to the Integrated Science, Science Support, and Facilities activities.						

### **Current Program Highlights**

Section 104 of the Water Resources Research Act of 1984 (P.L. 98-242), as amended by P.L. 104-147, establishes a Federal-State partnership in water resources research, education, and information transfer through a matching grant program that authorizes State Water Resources Research Institutes at land grant universities across the Nation. This program provides an institutional mechanism for promoting State, regional, and national coordination of water resources research and training, and a network of Institutes to facilitate research coordination and information and technology transfer. With its matching requirements, it is also a key mechanism for promoting State investments in such research and training.

Section 104 authorizes a maximum of 57 Water Resources Research Institutes, one at the land grant university in each State, the District of Columbia, and several U.S. territories. There are currently 54 Institutes: one in each State, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam, which also serves the Federated States of Micronesia and the Commonwealth of the Northern Mariana Islands. Section 104 requires a non-Federal to Federal cost sharing ratio of 2:1 and specifies that the Federal funds are not to be used to pay the indirect costs of the Institutes.

The Institutes have developed a constituency and a program that far exceeds that supported by their direct Federal appropriation. According to a 1998 report of the National Institutes for Water Resources, the Institutes had a combined operating budget of \$66.3 million in FY 1997. That is, they generated \$15.00 in support for each dollar appropriated to them through this program, with \$5.00 coming from other Federal funds and \$10.00 from non-Federal sources. In FY 1997, the Federal appropriation constituted only about 6.5 percent of the Institutes' total revenues.

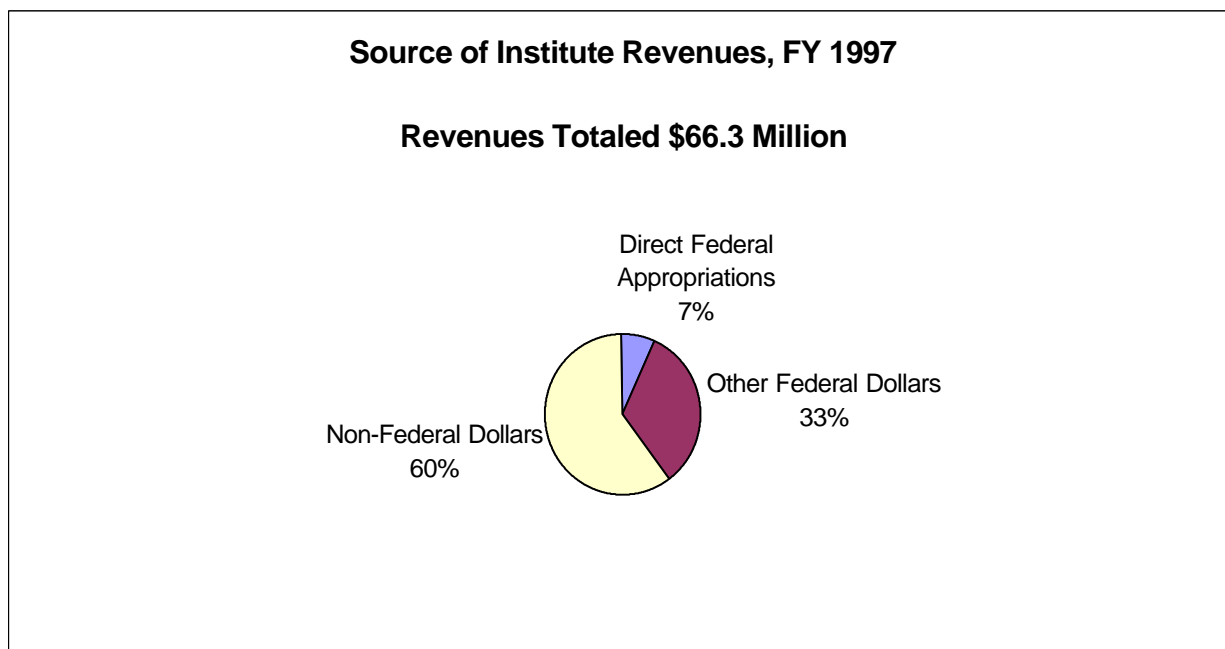


Figure W-8

However, not all of the Institutes have had the opportunity or been equally successful in leveraging their direct Federal appropriation into a larger program. In FY 1997, 19 of the Institutes had an annual budget less than \$400,000. These Institutes rely heavily upon the Federal appropriation.

Regardless of size, each Institute operates a program of multi-year research, education, and information transfer projects focused on State and regional water resource priorities. In FY 1997, the Institutes used about 76 percent of their total combined funds to support research. About 11 percent of the funds were expended on education and information transfer projects. The remaining 13 percent were spent on program development and coordination and on administration and other activities.

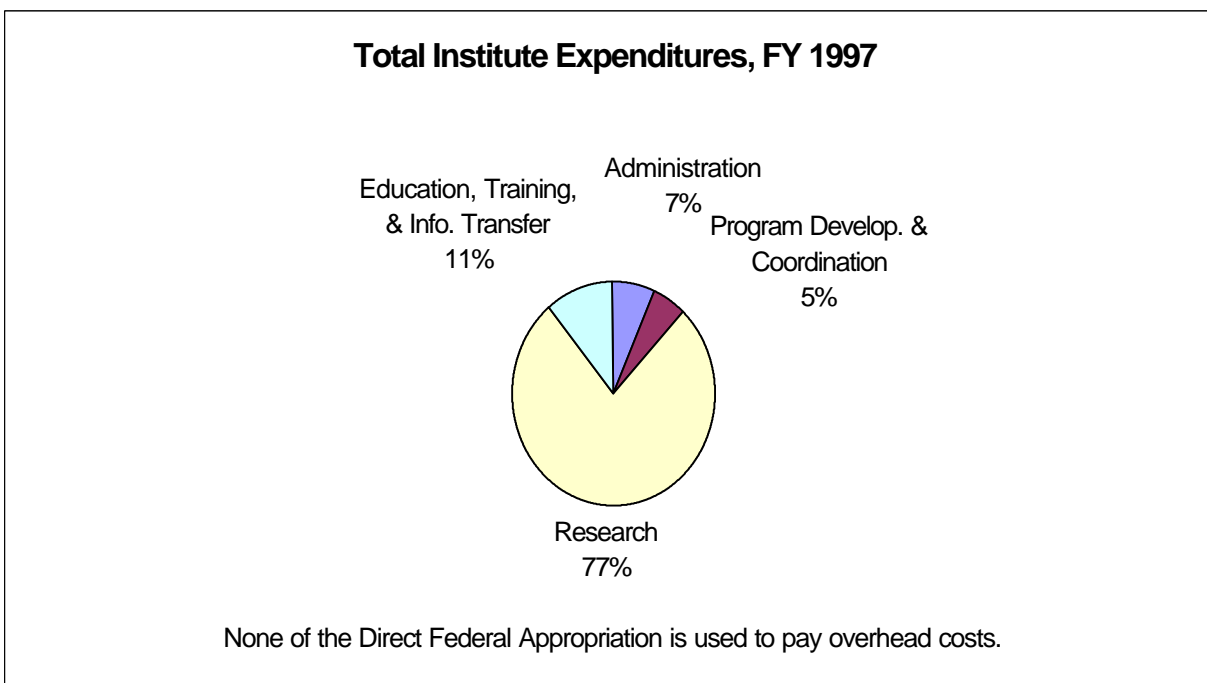


Figure W-9

In FY 1997, the Institutes supported a total of about 800 research projects nationwide. Though the emphasis varies across the Nation, depending upon State and regional priorities, the most common topics were concerned with surface-water and ground-water quality, toxic substances, and non-point source pollution. The Institutes collaborated with 177 other universities, 185 State agencies, and over 160 private sector or local government entities. In addition, the Institutes cooperated with over 180 Federal agency contacts. Each Institute, on average, worked with about 15 State and Federal agencies, or other organizations, on research projects.

The Institute program is a primary source of training for water scientists and engineers. In FY 1997, nearly 1,100 students received training by participation in Institute-supported research and information transfer projects. Students trained under this program provide the talent needed to meet the mandates of the many new programs for water resources protection that have come into existence in recent years and to support the water management initiatives of Federal, State, and local agencies.

Under their information and technology programs, the Institutes sponsor seminars, conferences and workshops, publish newsletters, reports, books, and articles in scientific refereed journals, and produce videos on water related topics. Since 1983, the Institutes have published nearly 1,000 reports of various types each year. Information on 10,000 of these publications is available on computer disk and on the Internet through the National Institutes for Water Resources (NIWR). In 1997, over 20,000 people participated in water conferences

sponsored or cosponsored by the Institutes, and the Institutes collectively distributed over 40 newsletters and other non-technical publications to more than 67,000 subscribers.

Though it provides only a portion of the total revenues of the Institute program, the Federal program influences the total Institute program in a number of ways. First, it links together water resources faculty at institutions of higher education across the Nation. The Institute directors are linked through their organization, NIWR, which cooperates with the USGS in establishing total programmatic direction and coordinating and facilitating regional research and information and technology transfer. The Federal program provides the funding bases for each Institute and promotes multidisciplinary and regional research.

**Institute Evaluations** — The Water Resources Research Act, as amended, requires that each Institute be evaluated at intervals not to exceed 5 years. Detailed evaluations of all 54 Institutes were conducted in 1994 to determine their eligibility to receive grants under the Act. The independent panel which conducted the evaluations based on evaluation reports submitted by the Institutes and site visits to four Institutes concluded that: "For a modest investment each year, an effective program of multidisciplinary research, education, and information transfer occurs in each 54 Water Resources Research Institutes or Centers. The Institute evaluation reports give a clear sense of a vigorous nationwide program resulting in substantial accomplishments." Detailed evaluations of all 54 Institutes are again being conducted in FY 1999 and will be completed in FY 2000.

**Publications** — A publication describing all reports produced by the Institute program since it came under the auspices of the USGS in 1984 was updated and published in 1995 in cooperation with NIWR. The publication summarizes all of the reports and contains a diskette so that the report citations can be accessed by personal computer. The database describing the report is also available on the Internet through NIWR site at <http://wrri.nmsu.edu/niwr/index.html>.

A report describing the FY 1999 research program of the Institutes will be published in cooperation with NIWR; similar reports were published in FY 1998 and earlier.

**Regional Competitive Grant Program Results** — In FY 1996, Congress recommended (H.R. Report 104-300, p. 36) that each Institute receive a base grant of \$20,000, and that the remainder of the funds be allocated on a competitive basis. For FY 1998, as in FY 1997 and FY 1996, the USGS structured a Regional Competitive Grant Program whereby the funds were divided equally among four regions and competitively allocated within each region (see Figure W-10, page 209). In FY 1998, a total of 46 grants were awarded to 32 Institutes. A total of 50 universities participated in the research funded under the grants, 13 of which were not Institute host universities.

**New Grant Process for FY 1999 and Beyond** — In conformance with Congressional intent, the FY 1999 program provides continued Federal support for the 54 Water Resources Research Institutes located at universities in each State, the District of Columbia, and the U.S. territories. \$3.8 million of the funds appropriated in FY 1999 will be used to support in each State a program in research, education, and information and technology transfer that has been developed in collaboration with each Institute's State advisory panel. The remainder of the funds will be competitively allocated among the Institutes under the provisions of section

104(g) of the Water Resources Research Act, which require that the research priorities be developed jointly by the Institutes and the USGS and that the funds be matched on a 1:1 basis. The FY 2000 program will be operated in the same manner.

A lead institute, working with the USGS, will solicit, review, and select research projects to be funded nationwide. Proposals seeking up to \$250,000 in Federal funds will be solicited for research addressing problems in non-point source pollution and water use. Specific research priorities will be jointly set by the Institutes and the managers of the USGS National Water-Quality Assessment and Water Use Programs. Proposal selection criteria will favor projects involving collaboration between the USGS and university scientists. Any university or college can apply for a grant through an institute. The USGS will award the grants, which can be for work over a period of up to 3 years and must be matched on a 1:1 basis.

**Program Administration** — USGS administration of the program is funded at \$237,000 and requires two FTEs. The USGS provides \$25,000 to a lead Institute assisting in the administration of the Competitive Grant Program conducted under the provisions of section 104(g) of the Water Resources Research Act.

### **Recent Accomplishments**

The Institutes support several hundred research projects each year, involving over 1,000 students. The results of this research initially appear in Institute reports and scientific journals. Eventually, much of this research results in changes in water management practices. The following are examples of some recent research accomplishments which have, or may soon have, management applications.

- The Environmental Resources Research Institute at Pennsylvania State University developed a water use vulnerability index rating based on whether or not regulated pesticide chemicals were used, transported, manufactured, stored, or disposed of in a watershed. The vulnerability index was applied to 7,840 public water supply sources in Pennsylvania. "Use" waivers were granted to water suppliers by the Pennsylvania Department of Environmental Protection (PaDEP) if the vulnerability index was below a threshold level. PaDEP estimated that the vulnerability index will result in \$16 million in annual savings in water chemical analysis costs.
- The Wisconsin Water Resources Center developed a method using submitochondrial particles (SMPs) isolated from beef hearts to measure concentrations of toxic substances in soil and water samples. SMP technology provides a rapid, inexpensive means of monitoring soil and water contaminants. Two patents have been issued for this technology through the Wisconsin Alumni Research Foundation. A Wisconsin-based remediation firm has an agreement with WARF to use the technology and is working with Water Resources Center personnel on further SMP research. The SMP environmental toxicity test was the subject of a film prepared by the Australian Broadcasting Corporation's science television program QUANTUM.
- The Texas Natural Resource Conservation Commission (NRCC) recently adopted the water rights analysis package (WRAP) developed through research sponsored by the

Texas Water Resources Institute as the centerpiece of its \$20 million regional water planning effort currently underway. WRAP evolved over a 10-year period from research projects initiated with funding from the Texas Water Resources Institute, then expanded with funding from other local, regional, and state authorities. WRAP was selected as the core planning tool from among 22 models evaluated by a group of consultants under contract to NRCC. WRAP will be used to evaluate the spatial distribution of water availability within the 16 planning regions in Texas.

- The Massachusetts Water Resources Research Center working with a team of University of Massachusetts, National Park Service, and USGS Biological Resources Division personnel has developed a Water Resources Management Plan for the Cape Code National Seashore, replacing one from 1981. The Plan reviews the existing knowledge base, focuses on several major problem areas for the future, and proposes an extensive research and outreach plan for the next decade.
- A Montana Water Resources Research Center project involving collaboration among university, State government, and industry participants is assessing the environmental factors which limit MTBE biodegradation for the purpose of enhancing remediation in the field. The project has found that, though MTBE biodegrades very slowly in the subsurface, biodegradation rates can be greatly enhanced with certain enrichment strategies. The project results are already shaping future remediation strategies to be implemented by State regulators.
- A team of researchers, with financial support from the Colorado Water Resources Research Institute and seven water organizations along the lower South Platte River, is developing computer tools to improve administration of conjunctive use of ground and surface water along the river. Meeting regularly with water managers, the team is developing computer tools to integrate satellite images of irrigated crops into GIS maps of cropping patterns, using GPS technology to accurately locate wells, and then estimating amounts of augmentation water needed to assure senior surface water rights are not damaged. This research is finding immediate use because of extensive stakeholder involvement. The results of this research are being used to prepare the scope of work for development of a South Platte River Decision Support System to be considered for funding by the 1999 session of the Colorado State legislature and in the development of the system itself.
- The Alabama Water Resources Research Institute brought together a team of researchers from three southeastern States (Alabama, Georgia, and Florida) to assemble both empirical and theoretical information on water resource allocations and to apply the findings to the current water allocation conflicts in the Apalachicola-Chattahoochee-Flint (ACF) and Alabama-Coosa-Tallapoosa (ACT) river basin shared by the three States. Information and data derived from this project is currently being used by the three-State negotiating team in its efforts to devise an equitable allocation formula for the water in the two basins. Students that worked on the project have been hired by the States, and project researchers are providing technical expertise for the ACT/ACF Compact negotiations. Project results are being developed into a book to be published by the University of Florida Press.

**FY 1998 REGIONAL COMPETITIVE GRANTS PROGRAM  
(Dollars in Thousands)**

<u>State</u>	<u>Grant Amount</u>	<u>Interstate/Regional Grants</u>
Alabama	\$ 90	
Arizona	147	Includes \$20K to CA; \$40K to OR
Arkansas	76	
Colorado	292	Includes \$21K to NY; \$34K to NE; \$73K to WA; \$45K to WY
Connecticut	52	
Florida	71	
Georgia	40	
Guam	151	Includes \$28K to MS; \$38K to SC; \$17K to PR
Hawaii	40	
Iowa	60	
Illinois	46	
Kansas	55	
Kentucky	73	
Massachusetts	26	
Maryland	73	
Maine	188	
Minnesota	118	
Mississippi	60	Includes \$19K to TN
Missouri	34	
Montana	86	
North Carolina	104	
Nebraska	155	Includes \$50K to KS
New Hampshire	74	
Nevada	230	Includes \$80K to NM
New York	198	
Ohio	213	
Pennsylvania	131	Includes \$24K to DE
Tennessee	49	
Vermont	56	
Virgin Islands	50	
Washington	128	Includes \$27K to ID; \$16K to OR
Wisconsin	35	
Total Competitive Grants	\$3,200	

Note: States not listed here did not receive a regional competitive grant. They received only a base grant of \$20K, which was provided to the Water Institute in each State.

Figure W-10